

REMARKS

Claims 1-40 are all the claims pending in the application.

I. Claims 1-11

Claims 1-11 are rejected under 35 U.S.C. § 103(a) as obvious by Bullock et al. (U.S. Patent No. 5,699,091) in view of Tadokoro (U.S. Patent No. 5,550,956) and Childers et al. (U.S. Patent No. 6,126,265). To establish a *prima facie* case of obviousness the Examiner must show that the prior art references, when combined, teach or suggest all of the claim limitations. See MPEP § 2143. Applicant respectfully submits that the references cited above by the Examiner fail to teach or suggest all of the claim limitations as set forth in the present application.

Specifically, Applicant submits that the references fail to teach a storing data “indicative of past environment of use of the ink cartridge.” The Examiner relies on Bullock col. 7:4-16 to teach this limitation. Bullock discloses, at column 7, lines 4-16, that temperature data is stored in an ink cartridge memory 76. However, the temperature data in Bullock appears to be a temperature correction coefficient that is used to accurately calculate drop counts that is preliminarily determined (col. 7:42-46). This is further supported by the fact that the temperature data is described, at column 7, line 8, in relation to heater resistor parameters because the heater resistor parameters may be changed depending on the temperature data (i.e. temperature correction coefficient) in order to enable accurate ink drop calculation. Accordingly, Applicant submits that Bullock does not teach storing, into a cartridge memory, data indicative of environment where the ink cartridge was actually used in the past. In other words, Bullock fails to teach storing past environment conditions in which the print cartridge was used and

exposed to. The temperature data of Bullock is merely a temperature correction coefficient and not actual data of past environment conditions.

Additionally, the Examiner relies on Tadokoro to teach history data indicative of a replaced consumable, such as an ink cartridge in a printer (Abstract, column 3, lines 38-48). However, Applicant submits, and the Examiner acknowledges, that the history data in Tadokoro is stored in a printer memory, not an ink cartridge memory as recited in the claimed invention (column 3, lines 62). Accordingly, Applicant submits that Tadokoro fails to teach or suggest storing history data in an ink cartridge memory. Thus, the references fail to provide any motivation to combine the storage of history data of Tadokoro in the ink cartridge memory of Bullock. While the Examiner states that this motivation is provided in Tadokoro at col. 1:20-28, upon close reading of this section of Tadokoro, the Examiner contention is inaccurate.

Tadokoro at col. 1:20-28 states that it is advantageous to store history information in the printer memory. Without the use of the present application, nothing in Tadokoro would provide any motivation to store such information in the print cartridge memory. Therefore, Applicant submits that the cited references fail to provide a proper motivation to combine.

Finally, the Examiner relies on Childers to teach storing cleaning data of a printhead (abstract, column 5, lines 5-35). However, Applicant submits that Childers teaches storing preliminarily determined condition of wiping (cleaning) into a cartridge memory for the purpose of effecting new software routines on a printer (column 3, lines 3-5, Column 5, lines 5-35). Said differently, Childers fails to teach or disclose storing, into a cartridge memory, data indicative of cleaning that was actually performed on a printhead in the past. This is further supported by the

fact that the data stored is "Factory-written data." See col. 5:20. In other words, the factory that produces the print cartridge places the preliminarily determined cleaning conditions into the memory. This data is not updated or changed, therefore, it cannot be indicative of the past cleaning conditions of the printhead because at the time the factory writes this data into the cartridge memory, past cleaning data cannot be known. Therefore, Childers fails to teach or disclose storing, into a cartridge memory, data indicative of cleaning that was actually performed on a printhead in the past.

In view of the above remarks, Applicant submits that the references fail to teach or suggest all of the limitations of claims 1-11. Consequently, Applicant respectfully requests that the rejection of claims 1-11 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

II. Claim 13

Claim 13 is rejected under 35 U.S.C. § 103(a) as obvious over Bullock et al. in view of Sakuma (U.S. Patent No. 5,663,750).

The Examiner relies on Sakuma to teach altering an ink discharge operation in accordance with a minimal ink amount and a remaining ink amount (Abstract). Sakuma discloses altering an ink discharge operation during printing in order to enable properly continuing printing even if remaining ink amount is small (column 1, lines 31-35, lines 57-61). However, claim 13 recites that the "ink cartridge is operable to alter an ink discharge operation during cleaning of the print head." Neither Sakuma nor Bullock teach or suggest altering an ink discharge operation during cleaning of the print head. Therefore, since neither reference teaches altering an ink discharge operation during cleaning of the print head, Applicant submits that the

combination of the cited references fail to teach every limitation of claim 13 are required under 35 U.S.C. § 103(a). Thus, Applicant respectfully requests that the rejection of claim 13 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

III. Claims 14, 16-20 and 24-26

Claims 14, 16-20 and 24 are rejected under 35 U.S.C. § 103(a) as obvious over Bullock et al. in view of Childers et al. Claims 25 and 26 are rejected under 35 U.S.C. § 103(a) as obvious over Bullock et al. in view of Childers et al., as applied to claim 24, and further in view of Kobayashi et al. (EP 841,173).

Regarding claims 14 and 16-20, for at least the same reasons discussed above with respect to claims 1-11, the references fail to teach or suggest storing data that is indicative of past use of the ink cartridge. Therefore, Applicant requests that the rejection of claims 14 and 16-20 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Regarding claims 24-26, Applicant submits that the cited references fail to teach judging whether a cleaning operation is necessary based on a minimal ink amount and a remaining ink amount. The Examiner relies on Childers (abstract and col. 5:20-35) to teach this limitation. However, Childers does not teach judging whether a cleaning operation is necessary but instead Childers teaches various cleaning operations (sub-routines) that are performed at scheduled intervals determined by preset factory parameters. Decisions as to whether a cleaning operation is necessary is not based on a minimal ink amount and a remaining ink amount as recited in claims 24-26. The Examiner has not cited, nor has Applicant found, any section within either Bullock or Childers that teaches judging whether a cleaning operation is necessary based on a

minimal ink amount and a remaining ink amount. Therefore, Applicant submits that the references fail to teach or suggest all of the limitations of claims 24-26. Accordingly, Applicant respectfully requests that the rejection of claim 24-26 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

IV. Double Patenting Rejection

Claims 1-11, 13, 14, 16-20 and 24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 19 of U.S. Patent No. 6,361,138 in view of Bullock et al. Applicant will file a terminal disclaimer once all prior art rejections have been overcome.

V. Allowable Subject Matter

Claims 27-34 and 36-40 stand allowed. Claims 12, 15, 21-23 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant requests that the Examiner hold rewriting claims 12, 15, 21-23 and 35 in abeyance until the rejections of the parent claims have been reconsidered.


In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

1. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head; and

a memory device formatted to store data indicative of the history of the ink cartridge, data indicative of past environment of use of the ink cartridge, and data indicative of past cleaning of the print head, said memory device having an area in which the data is stored in a rewritable manner.

3. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head;

a memory device formatted to store data indicative of the history of the ink cartridge, said memory device having an area in which the data is stored in a rewritable manner; and

wherein the data includes data indicative of a past maintenance processing required for use in a reproduction of the ink cartridge.

4. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head;

a memory device formatted to store data indicative of the history of the ink cartridge, said memory device having an area in which the data is stored in a rewritable manner; and

wherein the data includes data indicative of a past maintenance processing required for use in a reproduction of the ink cartridge;

wherein the data includes data indicative of a past condition of cleaning.

5. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head;

a memory device formatted to store data indicative of the history of the ink cartridge, said memory device having an area in which the data is stored in a rewritable manner;

wherein the data includes data indicative of a maintenance processing required for use in a reproduction of the ink cartridge; and

wherein the data includes data indicative of a condition of exchange of a part of the ink cartridge.

7. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head;

a memory device formatted to store data indicative of the history of the ink cartridge, said memory device having an area in which the data is stored in a rewritable manner;

wherein the data includes data indicative of the time of final ink depletion of the ink cartridge; and

wherein the data includes data indicative of a past maintenance processing required for use in a reproduction of the ink cartridge.

8. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head;

a memory device formatted to store data indicative of the history of the ink cartridge, said memory device has an area in which the data is stored in a rewritable manner; and

wherein the data includes data indicative of ~~an~~ a past environment in which the ink cartridge ~~is~~ was used.

13. (Three Times Amended) An ink cartridge for an ink jet type printing apparatus having a print head, the ink cartridge comprising:

a container having an ink chamber for containing ink therein;

an ink supply port for supplying the ink from said ink chamber to the print head; and

a memory device for storing data related to the ink or the ink cartridge, said memory device storing therein data relating to a minimum ink amount to be contained in the ink cartridge, said memory device having an area in which data indicative of a residual ink amount is stored in a rewritable manner;

wherein said ink cartridge is operable to alter an ink discharge operation during cleaning of the print head based on the stored data relating to the minimum ink amount and the residual ink amount.

14. (Twice Amended) An ink-jet printing apparatus comprising:

a print head for ejecting ink droplets;

an ink cartridge containing ink therein for supplying the ink to said print head;

a memory device storing data related to the ink cartridge, data related to past environment of use of the ink cartridge, and data related to past cleaning of the print head;

a control device accessible to said memory device for controlling said print head in accordance with data supplied from the exterior, said control device controlling a charging of the ink into said print head in accordance with data, stored in said memory device, when said ink cartridge is attached to the printing apparatus; and

said control device determines whether the print head needs cleaning and controls the cleaning operation.